ONTARIO MINISTRY OF ENVIRONMENT
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OPERATING SUMMARY

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Pickering Village : water
pollution control plant.

81552

Ontario

Ministry of the
Environment

135 St. Clair Avenue West
Toronto 195, Ontario

We are pleased to present you with the 1972 operating summary for the water pollution control plant serving your community.

This summary contains data on the performance of the plant as well as relevant financial information. Of particular interest is the review of the year's activities in which significant items of these data are discussed in some detail by the operations engineer and his staff who, by their day-to-day involvement with the operation, are thoroughly familiar with the plant.

We appreciate your continuing interest in protecting the environment through the efficient operation of this wastewater treatment facility.

D.S. Caverly,
Assistant Deputy Minister.

D.A. McTavish, P. Eng.,
Director,
Project Operations Branch.

MINISTRY OF THE ENVIRONMENT

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DEPUTY MINISTER
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ASSISTANT DEPUTY MINISTER
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ASSISTANT DIRECTOR
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REGIONAL SUPERVISOR
P.J. Osmond

OPERATIONS ENGINEER
A. Clark

135 St. Clair Avenue West
Toronto 195

PICKERING VILLAGE

WATER POLLUTION CONTROL PLANT

MINISTRY OF THE ENVIRONMENT

1972 ANNUAL OPERATING SUMMARY

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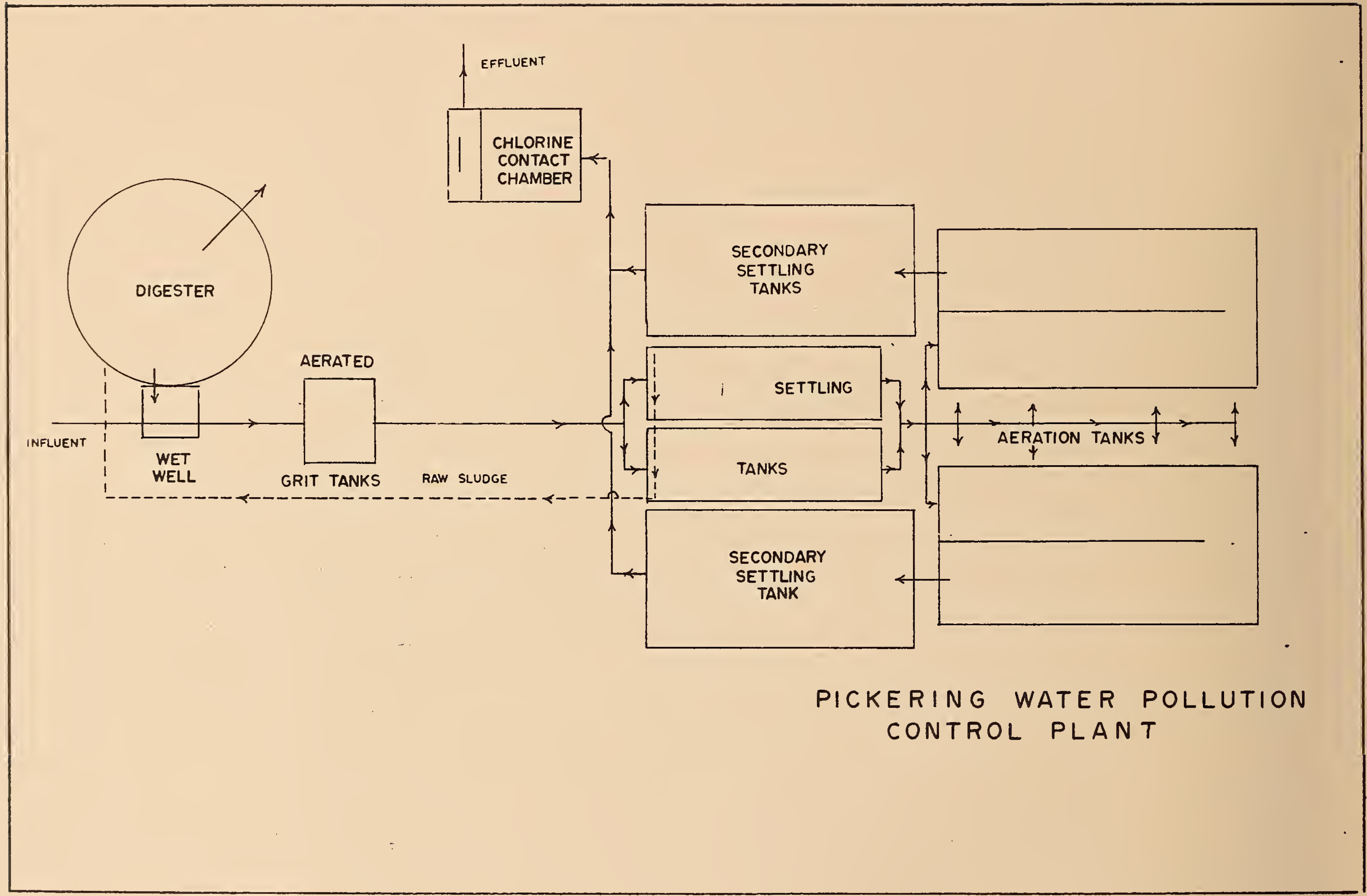


PICKERING WATER POLLUTION CONTROL PLANT

DESIGN DATA

PROJECT NO.		1-0015-66
TREATMENT		Con. Secondary
DESIGN FLOW		0.40 migd
BOD	- Raw Sewage	220 mg/l
	- Removal	90-95%
SS	- Raw Sewage	250 mg/l
	- Removal	90-95%

GRIT REMOVAL

Type: Aerated with airlift
Size: One 12' x 14' x 10' (eff. depth)
Volume: 1680 ft^3 or 10,500 gal
Detention: 38 minutes

COMMINUTION

Bar Screen - on by-pass

PRIMARY SEDIMENTATION

Size: Two 20' x 12' x12'6" (avg. depth)
Volume: 6000 ft^3 or 37,400 gal
Detention: 2.25 hours
Loading: Surface 795 gpd/ft^2 Weir

AERATION

Type: Diffused air, two-pass
Size: Two 35' x 2 x 12' x 12'
Volume: 20,000 ft^3 or 125,000 gal
Detention: 7.5 hours
Diffusers: Ceramic Tubes (17 per pass)

SECONDARY SEDIMENTATION

Size: Two 25' x 12' x 11'6" (avg)
Volume: 6900 ft^3 or 43,000 gal
Detention: 2.58 hr
Loading: Surface 666 gpd/ft^2
Weir 4160 gpd/ft

CHLORINE CONTACT CHAMBER

Size: 4 passes 12' x 5'4" x 10'9"
Volume: 2750 ft^3 or 17,200 gal
Detention: 62 minutes

DIGESTION

Single Stage, gas mixed, fixed concrete roof
Size: one 28' dia x 24' swd
Volume: 15,200 ft^3 or 95,000 gal

'72 Review

GENERAL

This project consists of an 0.40 mgd conventional secondary treatment plant with single stage digestion, a sewage collector system and a submersible pumping station. A portion of the collector system is owned by the Village and operated by the Ministry under an operating agreement. After a 15 minute detention in the chlorine contact chamber, the plant effluent flows into Duffin's Creek.

With additional sewers from the Rock Port subdivision, the Stately Homes subdivision and the Cooper subdivision flows increased as expected. However, throughout the year, particularly after a rainstorm or during thaws, the plant experienced heavy flows which approached 3.5 times the plant's design capacity. In view of the normal dry weather flow to the plant, it would appear that there are considerable illegal rain water drain connections to the sewer collector system. Since the sewer system is new, infiltration and storm water run off from streets should not be a problem.

New road construction in the villages necessitated re-construction of some sewers and services. Although minor problems were encountered the re-construction went smoothly with good co-operation from all parties involved.

PLANT FLOWS AND CHLORINATION

The total flow to the plant in 1972 was 88.8 million gallons. Compared to the 1971 total flow of 58.0 million gallons this was a 53 percent increase. The average daily flow to the plant was 0.24 million gallons, an increase of 50 percent from the previous year. The maximum daily flow, recorded in April, was 0.73 million gallons and the maximum rate at which the plant received raw sewage, again recorded in April was 1.4 million gallons per day.

Chlorine was applied to the plant effluent throughout the year. A total of 2164 pounds of chlorine was used at an average dosage of 2.4 mg/l to maintain an effluent residual of 0.5 mg/l.

PLANT EFFICIENCY

The average influent BOD and suspended solids were 298 mg/l and 426 mg/l respectively. The average effluent BOD and suspended solids were 4 mg/l and 9 mg/l respectively. The above figures represent an average reduction of 99 percent BOD and 98 percent suspended solids.

The average total phosphorus reduction was 89 percent in 1972.

SLUDGE DIGESTION AND DISPOSAL

A total of 810,000 gallons of raw sludge averaging 6.2 percent total solids was pumped to the digester in 1972. During the same period 243,620 gallons of digested sludge averaging 5.9 percent total solids were hauled by a contractor for disposal on land.

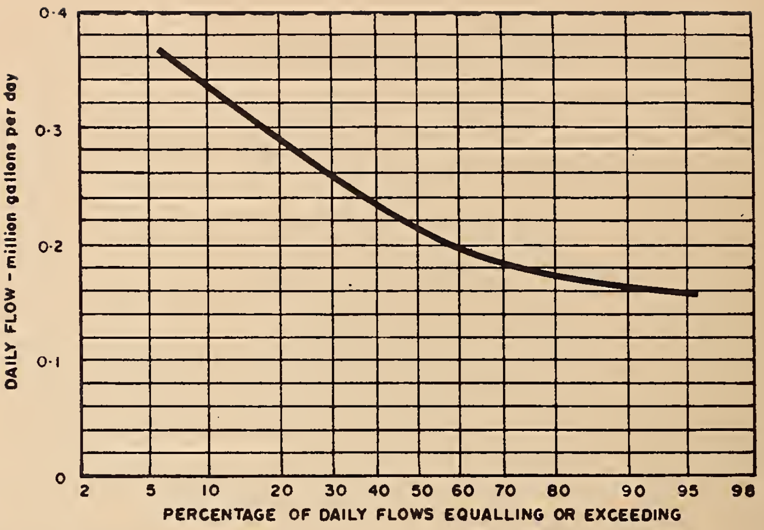
CONCLUSIONS AND RECOMMENDATIONS

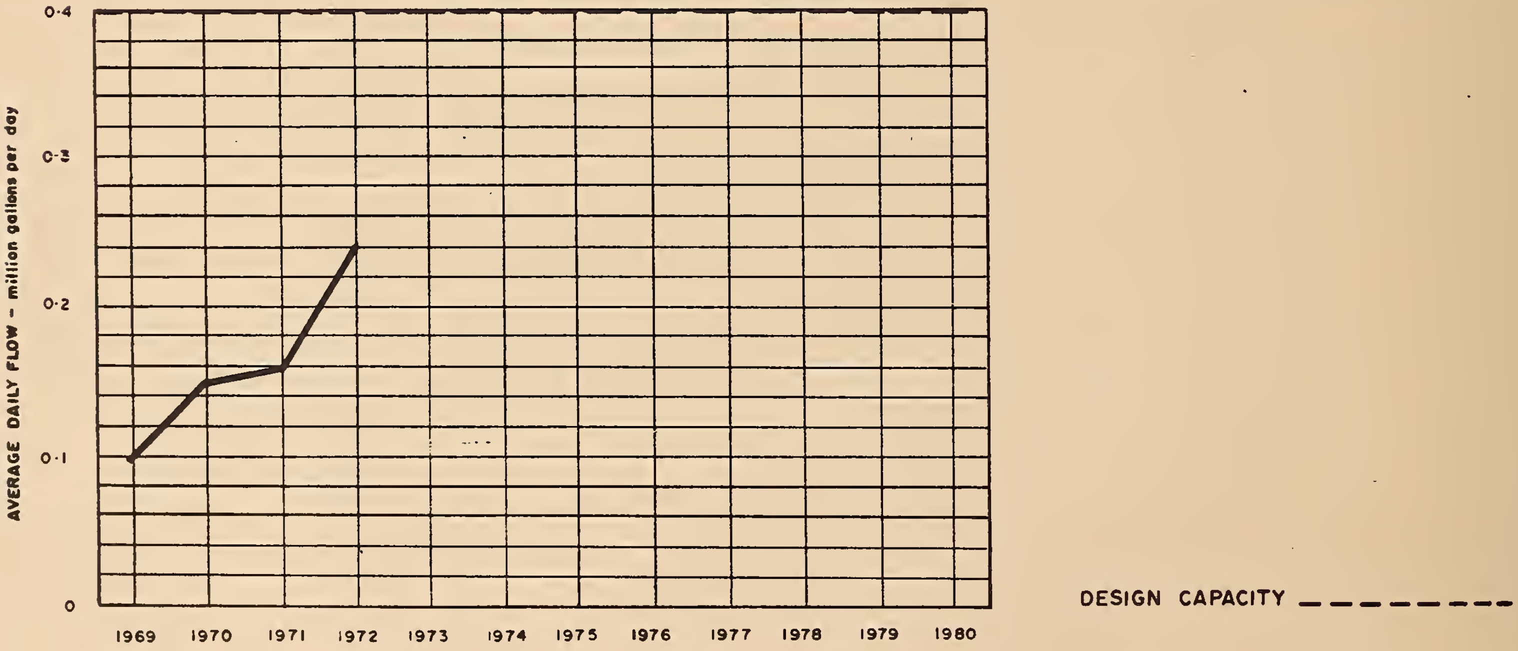
With the increased flows and BOD and suspended solids loadings, the plant operated well. The plant effluent was well within the Ministry's criteria of 15 mg/l for both BOD and suspended solids.

Since excessive flows to the plant are only experienced after a rain storm or during thaws, efforts should be made to control the access of rain water to the sanitary collector system.

PROCESS DATA

FLOWS

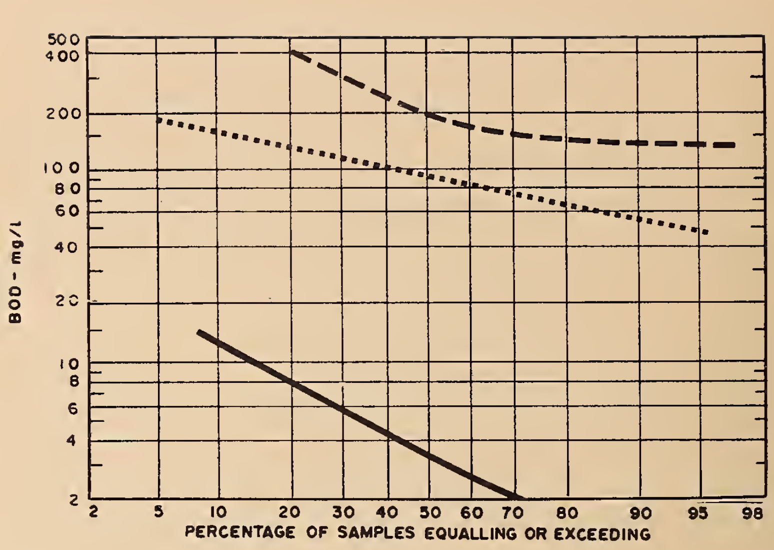


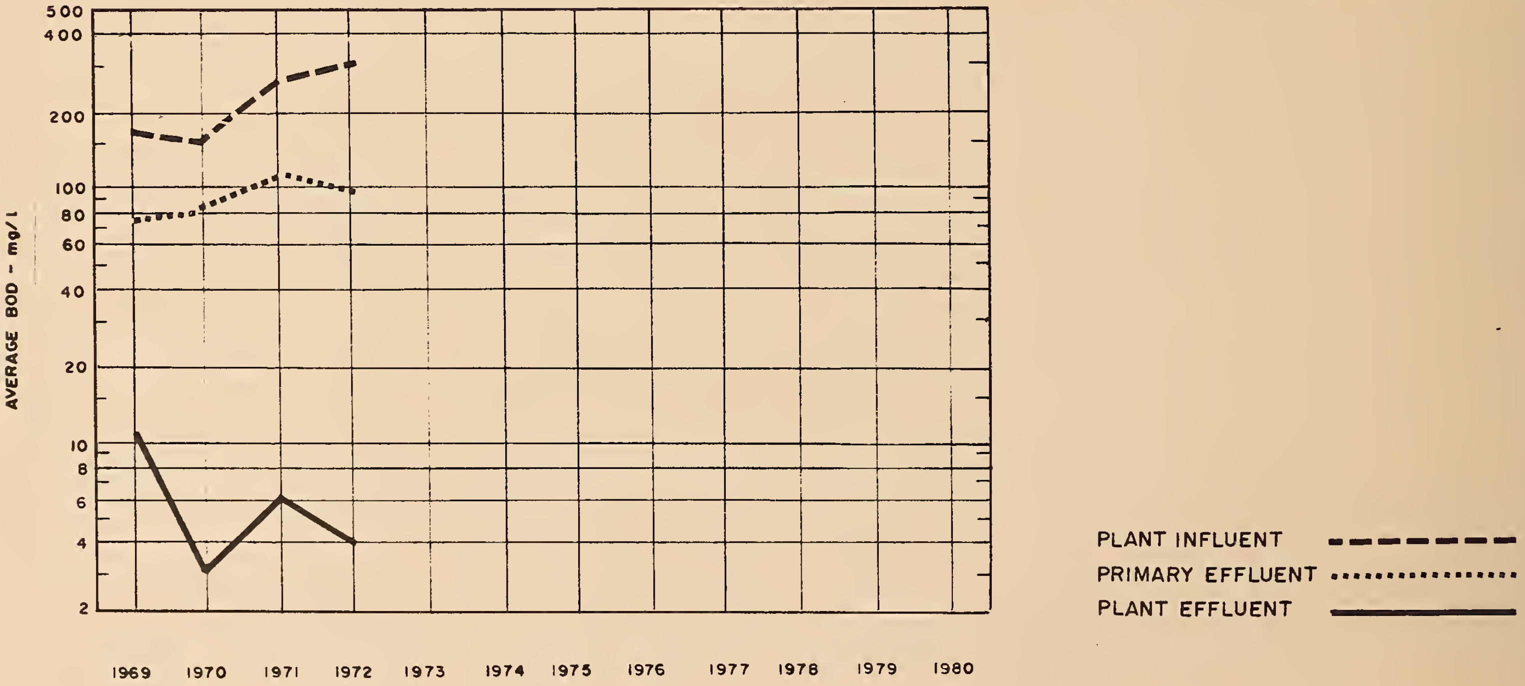


PLANT PERFORMANCE

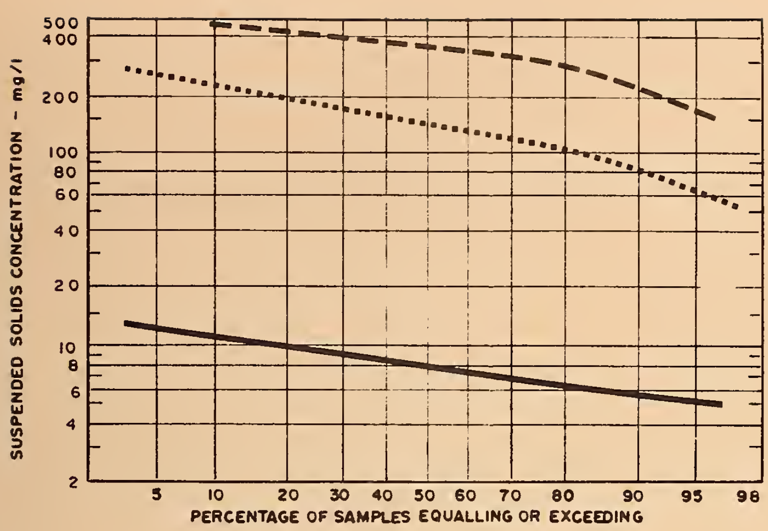
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW million gallons	AVERAGE DAY mil. gal	MAXIMUM DAY mgd	INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l	EFFLUENT mg/l	REDUCTION		INFLUENT mg/l P	EFFLUENT mg/l P
						%	10^3 pounds			%	10^3 pounds		
JAN	7.3	.23	.48	-	-	-	-	405	11	97	29	-	-
FEB	5.2	.18	.32	140	4	97	7	338	8	98	17	8.	.4
MAR	7.8	.25	.50	170	2	99	13	356	7	98	27	12.	.7
APR	12.1	.40	.73	-	-	-	-	449	9	98	53	-	-
MAY	7.4	.23	.33	200	3	99	15	346	7	98	25	9.	4.2
JUNE	6.6	.22	.31	145	2	99	9	275	6	98	18	11.	1.8
JULY	5.3	.17	.25	-	-	-	-	372	7	98	19	-	-
AUG	6.1	.19	.58	480	12	97	28	568	8	99	34	19.	1.2
SEPT	5.1	.17	.32	260	4	98	13	374	17	95	18	7.	1.9
OCT	6.5	.21	.34	1000	1	99+	64	1097	15	98	70	30.	1.1
NOV	8.8	.29	.42	140	1	99	12	330	7	98	28	9.	1.0
DEC	10.6	.34	.61	-	-	-	-	197	11	94	20	-	-
TOTAL	88.8	-	-	-	-	-	-	-	-	-	-	-	-
AVG.	-	.24	MAXIMUM .73	298	4	99	20	426	9	98	30	13.	1.4
No. of Samples	-	-	-	9	9	-	-	61	60	-	-	9	9

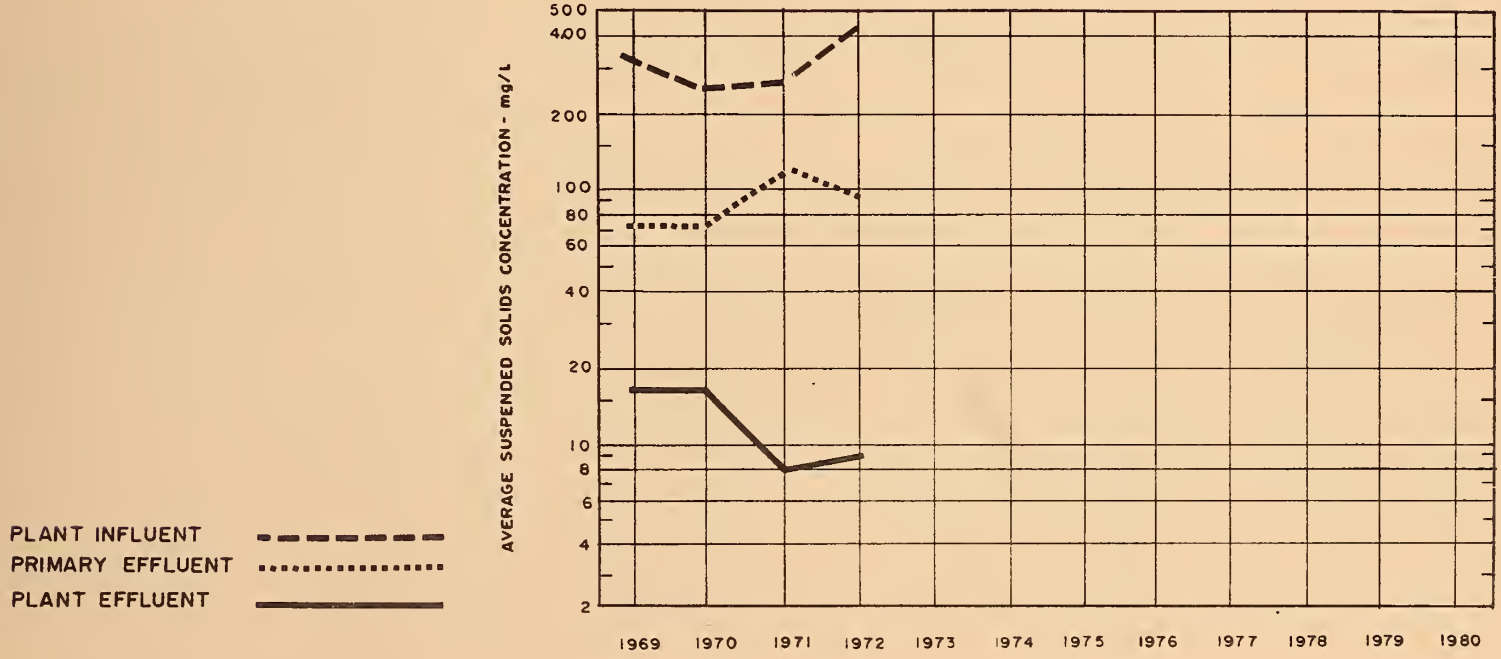
BIOCHEMICAL OXYGEN DEMAND



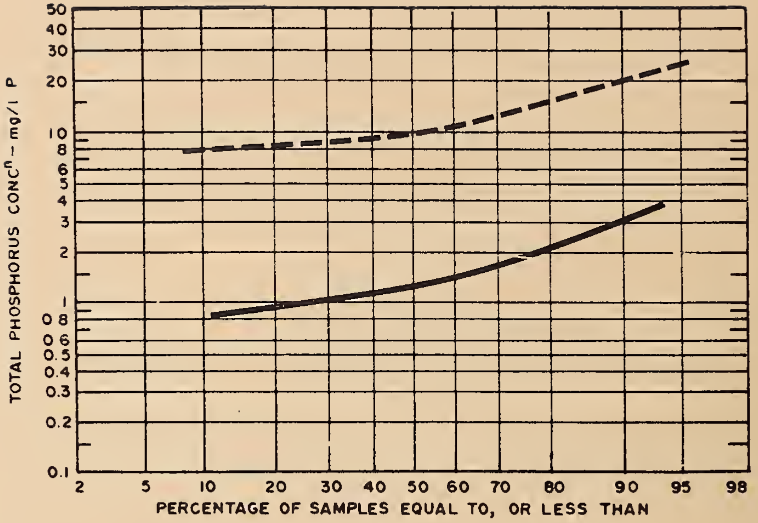


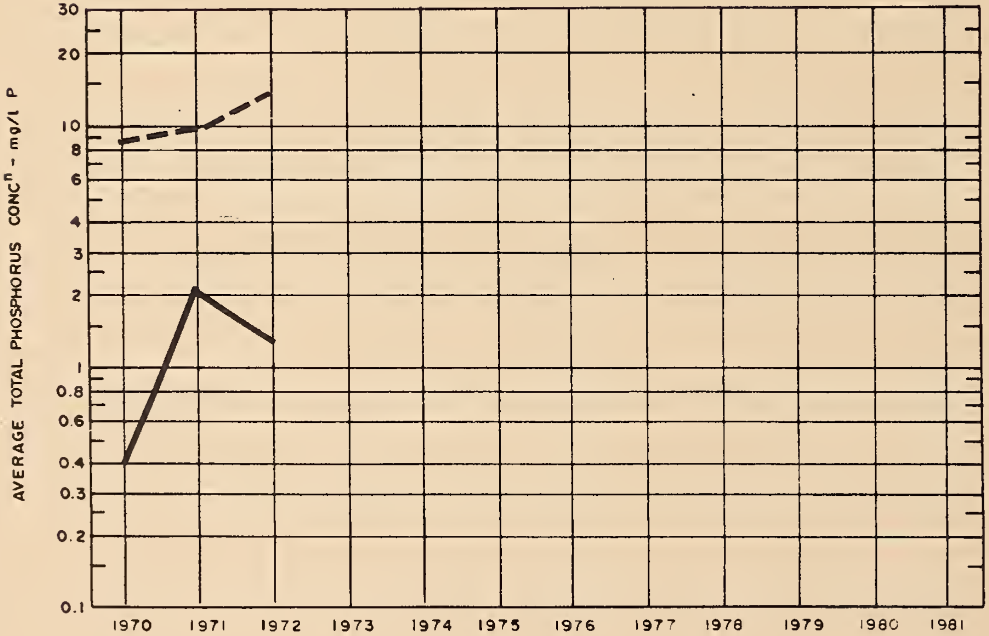
SUSPENDED SOLIDS





PHOSPHORUS

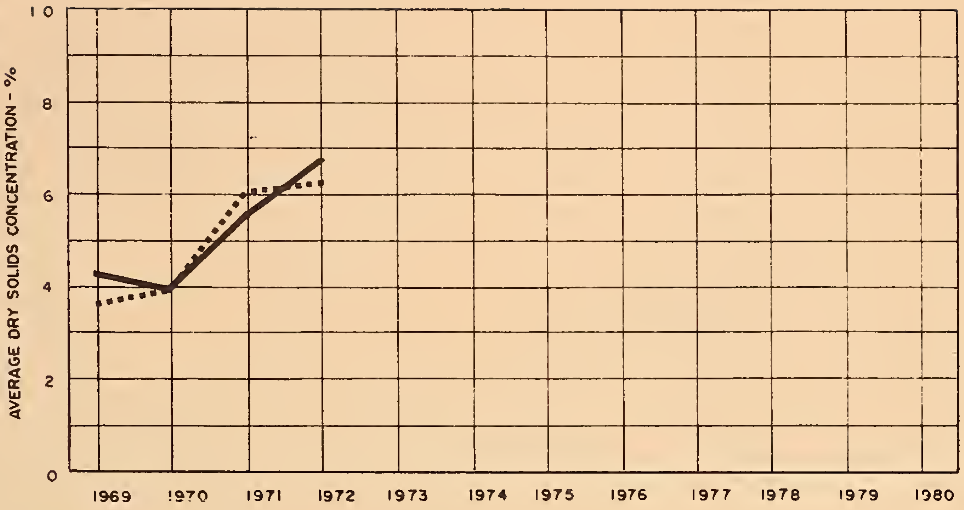


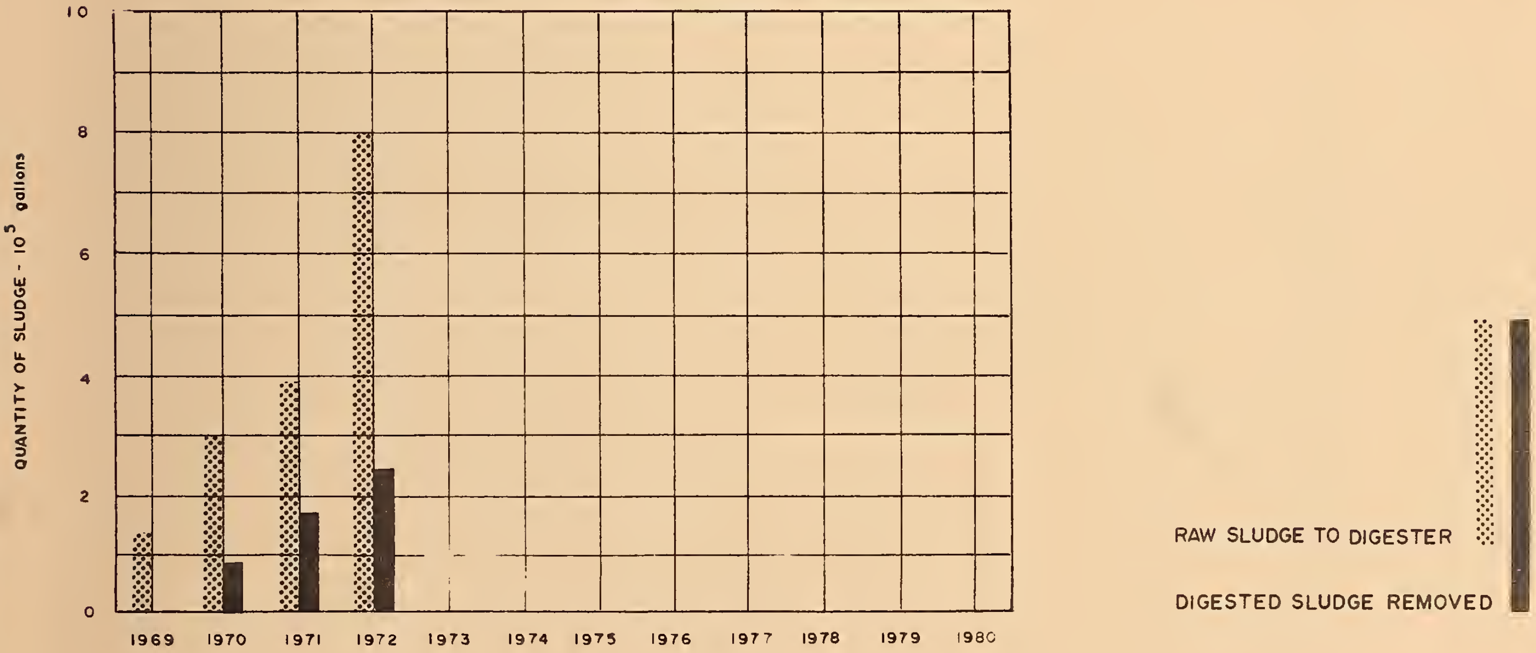


PLANT INFLUENT – – – – – –

PLANT EFFLUENT ———————

DIGESTION


AVERAGE DRY SOLIDS CONCENTRATION - %
10
8
6
4
2
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
RAW SLUDGE ·············
DIGESTED SLUDGE ———


QUANTITY OF SLUDGE - 10^5 gallons
10
8
6
4
2
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED

TREATMENT DATA

	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
									RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT	
MONTH	QUANTITY REMOVED cubic feet	Cl_2 USED pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day^{-1}	AIR $\frac{1000\ ft^3}{lb\ BOD}$	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10^3 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	T. S. %	AMOUNT HAULED cubic yards
JAN	15	186	2.5		155	1500			49	6.5	86	15	3.6	48	1.2	91
FEB	10	174	3.3		169	1200			63	5.0	86	21	6.7	44	1.	126
MAR	29	184	2.3		146	1200			63	5.0	86	21	6.7	44	1.	126
APR	21	200	1.6		192	1200			69	5.4	82	19	7.0	43	.1	112
MAY	21	168	2.3	38	135	1100	.06		71	6.0	85	21	6.8	43	.2	126
JUNE	27	156	2.4	105	144	1100	.17		71	7.0	86	16	9.5	49	.1	98
JULY	12	186	3.5		193	1100			74	6.0	85	24	7.0	41	.1	140
AUG	14	186	3.1	60	133	780	.12		66	5.8	82	25			.1	147
SEPT	23	180	3.5	150	200	1300	.15		66	6.2	85	20	7.0	44	.1	119
OCT	16	186	2.9	100	150	1300	.13		68	6.5	85	21	6.3	47	.1	126
NOV	10	142	1.6	120	144	1300	.21		71	7.0	82	20	8.8	43	.1	119
DEC	25	216	2.0		128	1100			79	8.3	86	20	6.8	43	.1	119
TOTAL	223	2164	–	–	–	–	–	–	810	–	–	243	–	–	–	1449
AVG.	2.5 cu. ft/mil gal	180	2.4	95	158	1200	.14		68	6.2	85	20	6.9	45	.4	121

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Pickering Village : water
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